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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,709	11/06/2001	Martin Dieter Liess	NL 000611	5866

7590

03/28/2003

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EXAMINER

MEYER, DAVID C

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,709

Applicant(s)

LIESS ET AL.

Examiner

David C. Meyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,7-12,17,20,21 and 23 is/are rejected.
- 7) ☒ Claim(s) 3-6,13-16,18,19,21,22 and 24-33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 21 is objected to because of the following informalities: Claim 21 recites the limitation "the at least one diode laser and associated detector" in line 3. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 8-9, and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Kolb, Jr. et al (US 3,644,042).

Regarding claims 1 and 8, Kolb, Jr. et al discloses an apparatus that executes a method of measuring the relative movement of the apparatus and an object. Kolb, Jr. et al discloses a laser **10** that illuminates an object **14**. Light reflected from the object reenters the cavity of laser **10** and alters its reflectivity according to the phase of the reflected beam. A radiation detector **26** generates an electrical signal corresponding to the intensity of radiation within the laser cavity which is fed to a pulse counter **32** for

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speed and direction determination. (See Fig. 1 and column 2, line 1 to column 4, line 20.)

Regarding claims 9 and 11, the laser cavity and radiation detector constitute a converting means with the radiation detector constituting a measuring means for measuring a change in laser operation.

Regarding claim 12, radiation detector **26** is arranged at the side of the laser cavity opposite the side where the measuring beam is emitted (Fig. 1).

3. Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Rink (US 5,262,636). Regarding claim 1, Rink discloses a proximity sensor that executes a method of detecting the movement of a target object beyond a predetermined distance. A laser diode **16** illuminates a target object **21**. Radiation reflected by the object reenters the laser housing **12** and combines with radiation emitted by the laser diode and incident on a photodiode **18**. The photodiode provides an electric signal representative of the combination of radiation emitted by the laser diode and radiation reflected by the target object. The strength of this signal reflects the proximity of the target object as it moves relative to the sensor. The operation of the laser housing is changed in that the current across the photodiode changes with the level of reflected radiation it receives.

Although Rink does not use the term interference when describing the combination of emitted and reflected radiation, some degree of interference is inherent in the disclosed configuration. (See Figs. 3 and 5 and column 3, line 54 to column 4, line 16.)

Regarding claim 9, the laser housing **12** and photodiode **18** constitute a converting means with the photodiode being a measuring means for measuring a change in the operation of the laser housing.

4. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Goodwin et al (US 4,733,609).

Regarding claim 1, Goodwin et al discloses a laser proximity sensor that executes a method of measuring the relative velocity between a target object and a device into which the proximity sensor has been incorporated. Goodwin et al discloses a laser diode **6** that illuminates a target **18** after passing through focusing optics **16**. Light reflected from the target reenters the laser cavity where it undergoes mixing with the main laser signal. The mixed light beam is directed onto a photodetector **22**, which outputs an electrical signal in response to the incident beam. The laser cavity and photodetector constitute a converting means. The electrical signal is used to determine a Doppler shift indicative of the relative velocity of the proximity sensor and target. (See Fig. 1 and column 8, line 11 to column 9, line 14.)

Regarding claim 2, Goodwin et al discloses that the electrical signal is supplied to a filter **26** and then to a second detector **28** where its shape, specifically its RF pulse envelope, is used to derive a DC pulse. The DC pulse is then be used by post detector processing circuitry **30** to determine the relative velocity between the proximity sensor and target.

5. Claims 1, 2, 7, and 9-10 are rejected under 35 U.S.C. 102 (a) as being anticipated by Suni et al (US 6,233,045).

Regarding claim 1, Suni et al discloses a self-mixing sensor apparatus for executing a method of measuring the movement of an object. Suni et al discloses a current source **60** which drives a laser diode **61**. The laser diode illuminates an object **64** along beam path **63** via lens **62**. Light reflected from the object returns to the laser diode and causes a temporally varying change in the impedance of the laser, which in turn causes voltage fluctuations across inductor **66**. Suni et al discloses that these fluctuations can be analyzed by a spectrum analyzer and a Doppler shift determined that indicates the relative speed of the sensor and the object. (See column 5, line 50 to column 7, line 14.)

Regarding claim 2, Suni et al discloses that the relative speed of the self-mixing sensor and object is determined based on a Doppler shift, which is a shape characteristic of the electrical signal representing the time varying impedance of the laser.

Regarding claim 9, the laser diode **61** and inductor **66** constitute a converting means with the inductor being a measuring means for measuring a change in the operation of the laser.

Regarding claims 7 and 10, Suni et al discloses that the inductor **66** measures the impedance of the laser.

Claim Rejections - 35 USC § 103

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suni et al (US 6,233,045).

Regarding claim 17, Suni et al discloses a lens **62**. Suni et al does not disclose that the laser **61** is positioned eccentrically with respect to the lens. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Suni et al by positioning the laser eccentrically with respect to the lens according to the specific environment in which the apparatus was used.

Regarding claim 20, Suni et al does not disclose that the laser is a horizontal emitting laser or that the laser is associated with a reflecting member. By the applicant's own admission horizontal emitting lasers are widely used due to their low cost relative to vertical cavity surface emitting lasers (Specification page 9). It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate a horizontal

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emitting laser into the invention of Suni et al in order to achieve lower production costs.

Regarding the reflecting member, it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate a reflecting member according to the specific environment in which the apparatus was used and the specific arrangement of the sensor and measured object.

9. Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suni et al (US 6,233,045) in view of Rink (US 5,262,636).

Regarding claim 21, Suni et al discloses a lens **62**, but does not disclose a base plate, or a cap member. Rink teaches a base plate **13** on which a laser **16**, laser housing **12**, and photodiode detector **18** are mounted. Laser housing **12** constitutes a cap member. A window **14** is accommodated in the housing. It would have been obvious to one of ordinary skill in the art to combine the disclosure of Suni et al with the teaching of Rink by mounting the laser and detector on a base plate; enclosing the laser in a housing or cap member having a window for transmitting laser light; and fixing the lens to the cap member in order to protect the laser and associated optics from damage and misalignment.

Regarding claim 23, it would have been obvious to one of ordinary skill in the art at the time of invention to construct the base plate, laser housing, and lens from a plastic material in order to achieve a lower production cost.

Allowable Subject Matter

10. Claims 3-6, 13-16, 18-19, 22, and 24-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form

including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose or fairly teach the invention as claimed, specifically:

In claims 3-4, the step of supplying the laser cavity with periodically varying electric current and comparing first and second measuring signals.

In claims 5-6, the step of determining a click action and a scroll action.

In claims 13-16, 18-19, and 26, second and third diode lasers.

In claim 22, a lens integrated in the cap member having a surface which is curved towards the base plate.

In claims 24-25, an optical fiber waveguide coupled to the diode laser, its end being positioned at the window of the laser housing or cap member.

Regarding claims 27-33, while the prior art of record does disclose the device of claim 9, it does not disclose or teach the applications of claims 27-33. Suni et al is directed to the art of speed, vibration, and dimension sensing in general, not to specific consumer products. The same holds for Kolb, Jr. et al. Meanwhile, Rink is directed to proximity sensing as a means of controlling the current provided to a laser diode and Goodwin et al is directed to velocity sensing as a tool for controlling a fuse operation in a projectile housing munitions.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rink (US 5,382,785) appears to disclose all of the elements of claims 1 and 9.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Meyer whose telephone number is 703-305-7955. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on 703-308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

DCM
March 21, 2003


DAVID PORTA
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